

**THAT WHICH IS CLAIMED IS:**

1. A thick film millimeter wave transceiver module comprising:
  - base plate;
  - a multi-layer substrate board having a
  - 5 plurality of layers of low temperature transfer tape and received on said base plate, said layers comprising at least one of
    - a DC signals layer having signal tracks and connections;
    - 10 a ground layer having ground connections;
    - a device layer having capacitors and resistors embedded therein;
    - a top layer having cutouts for receiving
    - 15 MMIC chips therein;
    - a solder preform layer located between said device layer and said top layer for securing any MMIC chips; and
    - a channelization plate received over the
    - 20 multi-layer substrate board and having channels formed to receive MMIC chips and provide isolation between transmit and receive signals.
2. A thick film millimeter wave transceiver module according to Claim 1, and further comprising isolation vias which extend through multiple layers down to the ground layer.
3. A thick film millimeter wave transceiver module according to Claim 1, and further comprising a radio frequency cover received over said channelization plate.

4. A thick film millimeter wave transceiver module according to Claim 1, wherein each of said layers within said multi-layer substrate board is about 2 to about 4 mil thick.

5. A thick film millimeter wave transceiver module according to Claim 4, wherein said layers are about 3 mil thick.

6. A thick film millimeter wave transceiver module according to Claim 5, wherein said top layer is about 4 mil thick.

7. A thick film millimeter wave transceiver module according to Claim 1, wherein said base plate is formed from a CTE matched material.

8. A thick film millimeter wave transceiver module according to Claim 1, wherein said base plate is about 0.1 to about 0.3 inches thick.

9. A thick film millimeter wave transceiver module according to Claim 8, wherein said base plate is about 0.125 inches thick.

10. A multi-layer thick film substrate board used in transceiver modules comprising:

a plurality of low temperature transfer tape layers, said layers comprising one of at least:

5 a DC signals layer having DC signal tracks and connections;

a ground layer having ground connections;

10 a device layer having capacitors and resistors embedded therein;

a top layer that receives MMIC chips therein; and

a solder preform layer located between said device layer and said top layer for securing any MMIC  
15 chips received within the top sheet.

11. A multi-layer thick film substrate board according to Claim 10, and further comprising isolation vias which extend through multiple layers down to the ground layer.

12. A substrate board according to Claim 10, wherein each of said layers within said multi-layer substrate board is about 1 to about 4 mil thick.

13. A substrate board according to Claim 12, wherein said layers are about 3 mil thick.

14. A substrate board according to Claim 10, wherein said top layer is about 4 mil thick.

15. A substrate board according to Claim 10, wherein said base plate is formed from a CTE matched material.

16. A thick film millimeter wave transceiver module comprising:

base plate;

a multi-layer substrate board received on  
5 said base plate and having a plurality of layers of low temperature transfer tape, said layers comprising one of at least

a DC signals layer having DC signal tracks and connections;

10                   a ground layer having ground  
                  connections;  
                  a device layer having capacitors and  
                  resistors embedded therein;  
                  at least one MMIC chip received on the  
15   substrate board and secured by a solder connection  
                  thereto and operatively connected to said layers; and  
                  a channelization plate received over the  
                  formed multi-layer substrate board and having channels  
                  formed to receive MMIC chips and provide isolation  
20   between transmit and receive signals.

17. A thick film millimeter wave transceiver module according to Claim 16, and further comprising isolation vias which extend through multiple layers down to the ground layer.

18. A thick film millimeter wave transceiver module according to Claim 16, and further comprising a solder preform layer for securing the at least one MMIC to said substrate board.

19. A thick film millimeter wave transceiver module according to Claim 16, and further comprising a silver epoxy securing the at least one MMIC to the substrate board.

20. A thick film millimeter wave transceiver module according to Claim 16, and further comprising a radio frequency cover received over said channelization plate.

21. A thick film millimeter wave transceiver module according to Claim 16, wherein each of said

layers within said multi-layer substrate board is about 2 to about 4 mil thick.

22. A thick film millimeter wave transceiver module according to Claim 21, wherein said layers are about 3 mil thick.

23. A thick film millimeter wave transceiver module according to Claim 16, wherein said base plate is formed from a CTE matched material.

24. A thick film millimeter wave transceiver module according to Claim 23, wherein said base plate is about 0.1 to about 0.3 inches thick.

25. A thick film millimeter wave transceiver module according to Claim 24, wherein said base plate is about 0.125 inches thick.

26. A method of forming a thick film millimeter wave transceiver module comprising the steps of:

forming a base plate;

5 forming a multi-layer substrate board having a plurality of layers of low temperature transfer tape; receiving the substrate board on the base plate, wherein the substrate board comprises one of at least

10 a DC signals layer having signal tracks and connections;

a ground layer having ground connections;

15 a device layer having capacitors and resistors embedded therein;

a top layer having cutouts for receiving MMIC chips therein; and  
securing the MMIC chip by solder.